

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF HAWAII

- - - - In the Matter of the Application of - --) PUC Docket 2008-0273

PUBLIC UTILITIES COMMISSION

Instituting a Proceeding to
Investigate the Implementation
Of Feed-In Tariffs

PUBLIC UTILITIES
COMMISSION

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LIFE OF THE LAND'S
COMMENTS ON PROPOSED TIER 3 TARIFF FILINGS
&
CERTIFICATE OF SERVICE

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Aloha Commissioners,

On October 20, 2008, the Governor of the State of Hawaii, the State of Hawaii Department of Business, Economic Development and Tourism, the State of Hawaii Division of Consumer Advocacy of the Department of Commerce and Consumer Affairs ("Consumer Advocate"), and the HECO Companies entered into a comprehensive agreement designed to move the State away from its dependence on imported fossil fuels for electricity and ground transportation, and toward "indigenously produced renewable energy and an ethic of energy efficiency."

On October 20, 2008, the Public Utilities Commission ("Commission") opened a docket on Feed-In Tariffs ("FiT").

On September 25, 2009 the Commission issued a Decision and Order ("D&O") which set forth the general principles for the implementation of feed-in-tariffs. ("Decision")

"The commission will direct the HECO Companies to adopt FITs in their respective service territories." (Decision p.17)

"FITs provide an additional and complementary option to existing and future renewable resource procurement mechanisms, and should not result in replacement of any existing mechanisms. The commission, however, may revisit this issue in connection with the first FIT reexamination in two years." (Decision pp.17-18)

"Given the uncertainty of feedstock cost and availability, the commission ...will not include biofuel projects in the initial FIT." (Decision p.34)

Tier	Project Size	Type	Limits
1	0-20 kW on all islands		
2	Greater than 20 kW and up to and including:	PV	500 kW on Oahu, 250 kW on Maui and Hawaii, and 100 kW on Lanai and Molokai
		CSP	500 kW on Oahu, Maui, and Hawaii and 100 kW on Lanai and Molokai
		In-line hydropower	100 kW on all islands
		onshore wind	100 kW on all islands
3	Greater than Tier 2 maximums		Lesser of 5 MW on Oahu and 2.72 MW on Maui and Hawaii or 1% of the system peak load from the previous year; wind generation is precluded on Maui and Hawaii

"The commission directs the HECO Companies to develop reliability standards for each company, which should define most circumstances in which FIT projects can or cannot be incorporated on each island. The HECO Companies should incorporate the other parties to this docket into the process of crafting these standards." (Decision p.50)

"Caps are an appropriate mechanism by which to limit the potential initial ratepayer consequences and reliability effects of the FIT. Caps are particularly important prior to the first periodic reexamination, given the inherent imprecision in setting initial FIT rates and the uncertainties of the types of projects likely to be constructed and at what locations." (Decision p.54)

"FIT rates should support a typical or average project" that is reasonably cost-effective" (Decision p.62)

“With respect to the smaller projects in Tiers 1 and 2, the commission expects the parties to quickly reach an agreement on interconnection costs to have a FIT in place for those tiers as expeditiously, as possible. ...For Tier 3 the commission recognizes that ...interconnection may not be standardized at those sizes.” (Decision p.68)

On January 7, 2010¹ HECO filed their proposed Schedule FiT Tier 1 and 2 Tariffs and Agreement (96 pages). On January 21, 2010 parties filed their responses.

On April 22, 2010, HECO filed their Responses to Information Requests re Tier 3 (207 pages). On April 29, 2010 HECO filed the proposed “Schedule FIT Tier 3 Tariffs and Agreement” (207 pages).

(I) Introduction

Life of the Land believes that there are limits to renewable energy penetration levels based on reliability, the Level of Intermittency (“LOS”), the Level of Technological Diversity (“LOTD”), and the Level of Geographical Diversity (“LOGD”). However, the utility has been unable to offer substantive evidence that the grid systems are anywhere near the limit. Until the utility can justify their position, they should not be allowed to block achievement of their own Energy Agreement. Any other Commission ruling would allow the utility the talk the talk, but to say they cannot walk the walk because the Commission is blocking them.

In 1981-83 HECO created the Hawaii Energy Industries (“HEI”). HECO became HEI’s subsidiary. HECO alleged a parent group could more easily move into renewables than the utility. HEI instead invested in real estate, insurance, banking and transportation companies.

Around 2000 HECO said the solution was actually a child (subsidiary) rather than a parent (HEI). Thus HECO subsidiary Renewable Hawaii Inc ("RHI") was established. But RHI was unable to bring a single renewable energy project online.

In 2008 HECO proposed that the solution was neither a parent (HEI) nor a child (RHI), but themselves. Feed-In Tariffs offers the best opportunity for a large number of renewable energy systems.

Then in February of this year the utility objected to more renewables on Maui and Hawaii Counties, while limiting renewables on O`ahu because some of the renewable energy space on O`ahu had to be reserved for the speculative Lana`i and Moloka`i wind farms.

The utility wants a go-slow approach to Feed-in Tariffs.

Life of the Land believes that from security, balance of trade, economic, financial, environmental and cultural perspective, it is too late to adopt a go slow approach, we must instead transform rapidly from a high-climate-impact fossil fuel paradigm to a low-climate-impact, culturally and environmentally sensitive indigenous renewable energy paradigm.

(II) Reliability Standards Working Group

HECO proposes to establish a Reliability Standards Working Group ("WorkingGroup ") that would "serve as an open and transparent forum."¹

Attached to this parent group would be the Technical Support Group ("TechGroup") that would handle everything technical.

¹ HECO Response to Commission, dated February 26, 2010 ("Responses"), page 4

The TechGroup would be chaired by HECO and its members chosen by HECO. The TechGroup members would be (a) HECO; (b) HECO consultants; (c) HECO Energy Agreement co-signers; (d) the Electric Power Research Institute ("EPRI") (the utility trade group HECO belongs to); and (e) the Hawaii Natural Energy Institute ("HNEI") which is working the implement the HECO Energy Agreement.

The TechGroup would determine the reports that need to be written, would establish their scope and assumptions, and would review the draft and final reports. Sanitized summaries would be provided to the WorkingGroup.

Similarly to the Integrated Resource Planning ("IRP"), where the utility must listen to but does not have to respond to comments from IRP Advisory Group members – the TechGroup may listen to and ignore WorkingGroup suggestions.

WorkingGroup members could file dissenting opinions to the Commission that would be void of independent and TechGroup transmission studies. These dissents would not be data-based and would be filed and forgotten. HECO stated that "information pertaining to proposed renewable energy projects such as their size, location, and operational characteristics might need to be protected as business confidential, out of respect to developers' competitive concerns." (HECO Response to SA/HSEA-SIR-7)

This information is available under protective seal to non-competitors in Commission dockets. For example, Life of the Land was privy to all submittals by all responders to HECO and MECO biofuels RFPs. However, it would be private to WorkingGroup non-competitors.

Thus the creation of the WorkingGroup appears to be to give legitimacy to a HECO-driven sub-group which would submit HECO arguments against everything non-HECO.

This approach is unacceptable.

(III) Renewable Energy Penetration Levels

“The Hawaiian Electric Companies Have Some of The World's Highest Levels Of Renewable Energy Penetration” (Letter from HECO to the Commission dated February 8, 2010.

The Statement is not true:

Electricity from Renewable Energy: Iceland 100%, La Desirade (France) 100%, Fiji 79.6%, Norway 76%, Samsoe (Denmark) 75%, Austria 72%, Pellworm (Germany) 66%, Reunion (France) 56%, Sweden 55%, Dominica 48%, Latvia 47%, Flores Island (Azores, Portugal) 42%, Samoa 38.5%, Sao Miguel Island (Azores, Portugal) 35%, Faeroe Islands (Denmark) 35%, St Vincent and the Grenadines 32.8%, California 31%, Slovenia 31%, Marie Galante Island (Guadeloupe, France) 30%, Corsica 30%, Miquelon (St Pierre and Miquelon, France) 29%, Portugal 29%, Hawaii Island 29%, Romania 28%, Finland 28%, Turkey 24%, **World 18%, State of Hawai'i 8%.²**

The Statement is not relevant:

It is the Level of Intermittency (LOS), the Level of Technological Diversity (LOTD), and the Level of Geographical Diversity (LOGD) that are relevant.

² Sources: United Nations; US Energy Information Administration; European Environmental Agency; Renewable Energy on Small Islands; The Guardian; Highlands and Islands Enterprise Network; Renewable Energy Policy Network for the 21st Century

20% from one central station wind or solar system is less desirable than

(a) 100% from one baseload renewable system; OR

(b) 50% from 50 small renewable energy facilities (of one type only); OR

(c) 25% from multiple types (wind, solar electric, solar thermal); OR

(d) 20% from one central station where supply mirrors the demand

* The confusion between (a) “renewable energy” and (b) “intermittent energy” occurs throughout the paper.

* The confusion between (a) the reliability of large central station generators versus (b) small dispersed generators versus (c) hybrids systems with large central station and small dispersed generators also occurs throughout the paper.

(IV) Renewable Energy Penetration Levels at the Distribution Level

By island, renewable energy penetration levels at the distribution level vary greatly, ranging from over 43% on Lanai to less than 3% on Maui.³

By distribution circuit, renewable energy penetration levels at the distribution level vary greatly, from over 60% to 0%.⁴

Even though renewable energy penetration levels exceed 60% for some circuits and 40% for some grids, HECO does not want circuits to exceed 15% based on existing and planned renewable energy projects. That is, if a circuit is at 0% but there is a plan in the intermediate future to bring it up to 15%, there is “no

³ Distribution Level Penetration % of Peak System Load: Lanai (43.7%), Molokai (5%), Hawaii (4.7%), Oahu (3.3%), Maui (2.9%) Source: Table 1, Exhibit 1, page 12

⁴ “HECO does have several distribution feeders with penetrations approaching 15% penetration) (Exhibit 1, page 2) “The HELCO system also has individual circuits with up to 62% penetration.” (Exhibit 1, page 15) “Lanai has three 12 kV distribution circuits serving the entire island load. One circuit has 1,207 kW of Photovoltaic (PV) and 830 kW of generation (Combined Heat and Power [CHP]).” (Exhibit 1, page 27)

room” for a net metered system to be installed today. This argument lacks credibility and is counter-productive to getting off imported fuels.

(V) Reliability Issues

“The term *transmission constraint* may refer either to a piece of equipment that limits electricity flows in physical terms, or to an operational limit imposed to protect reliability. ... Congestion also occurs in areas where the grid is managed by individual integrated utilities rather than by regional grid operators; however, since transmission, generation and redispatch costs are less visible in these areas, the costs of congestion are not as readily identifiable.”⁵

“Wind curtailment initiatives appear to be increasing, perhaps in part because of the rapid growth of wind power, and the lack of development of supporting transmission infrastructure to keep up. To date, with the exception of isolated systems such as Hawaii, it appears that wind curtailment occurs for two primary reasons: 1) lack of available transmission during a particular time to incorporate some or all of the wind generation; or 2) high wind generation at times of minimum or low load, as wind generation in some regions may have production characteristics nearly opposite of electricity demand, and the energy cannot be exported to other balancing areas because of lack of transmission. As wind penetration levels in most balancing areas in the United States are still quite low, the primary cause of most wind curtailments can be attributed to a lack of transmission capacity.”⁶

The report Quantifying PV Power Output Variability Thomas E. Hoff and Richard Perez notes that “There is a growing concern about the effects of photovoltaic (PV) power output variability on utility grid stability. High levels of

⁵ National Electric Transmission Congestion Study (2006) US DOE
www.docstoc.com/docs/19740453/Congestion_Study_2006-9MB

⁶ Wind Energy Curtailment Case Studies: May 2008 — May 2009 By S. Fink, C. Mudd, K. Porter, and B. Morgenstern. Exeter Associates, Inc. Columbia, Maryland. www.nrel.gov/docs/fy10osti/46716.pdf

minute-by-minute output variability during partly cloudy conditions reported at some central station PV facilities have created an awareness of this issue. Some industry professionals believe that this issue could constrain the penetration of grid-connected PV. These and other concerns prompted the US Department of Energy to hold a workshop on “High Penetration of Photovoltaic (PV) Systems into the Distribution Grid” in February 2009. Many participants identified PV output variability as a top research priority. There has been a fair amount of work devoted to understanding the variability associated with the solar resource for a single location. ...Minimal work, however, has been devoted to understanding the effect on irradiance variability of combining multiple locations.”⁷

The Report goes on to say that as you increase the dispersion and number of small systems there is a “smoothing effect” on the variability of the “fleet”. To illustrate this point the report compares data from a 5MWDC PV plant with modeled data on 1,000 5kW distributed PV systems and finds that while the PV plant shows 50- 60% fluctuations in output over a 1 minute time interval the same amount of distributed power would have less than 3% variation over the same time interval.⁸

The report also addresses wind vs solar issue eloquently “an underlying assumption that some sort of mitigation effort is required to protect against short-term variability because PV, like wind, is powered by a non- controllable renewable resource. It is important to recognize, however, that there are fundamental differences between PV and wind. The most important difference is that PV power is proportional to irradiance while wind power varies as the cube of the wind speed. For example, if both irradiance and wind speed double over a very short interval of time, PV output would increase by 100 percent

⁷ Quantifying PV Power Output Variability by *Thomas E. Hoff and Richard Perez*. Clean Power Research. 2009
www.cleanpower.com/research/capacityvaluation/QuantifyingPVPowerOutputVariability.pdf

⁸ *Id.* Page 40

while wind generation would increase by 700 percent. Whatever the cause, the general perception is that this issue could adversely impact the adoption of grid-connected PV.”⁹

“Currently the commercially-available simulation tools do not incorporate PV system models or solar resource information. There is also a need to be able to evaluate the impacts of PV and loads as an integrated system.”¹⁰

“Synergy Between Renewable Sources ...Hydropower and solar power are also intermittent resources, due to their dependence meteorological conditions. However, the variables affecting these three different forms of renewable resource are independent of each other and do not necessarily occur at the same time. They can therefore be partially mutually compensated. Analyzing 50 years of data on wind velocity in Portugal shows high variation relative to the average year, with a consequent impact on the yearly variation curve. The wind velocity and the water inflow have average variations through the year which follow a similar pattern and their two curves have a high correlation (0.98). The solar radiation varies almost inversely, relatively to the wind velocity and the water flow (correlations of -0.7 and -0.66, respectively). That observation indicates that the complementary relationship between solar energy and wind/hydro is favourable. Solar energy can therefore be used to smooth seasonal variations of wind power.”¹¹

⁹ Id. pages 12-13

¹⁰ High Penetration of Photovoltaic (PV) Systems into the Distribution Grid. Workshop Report, p. 6. February 24-25, 2009 Ontario, CA Sponsored by: U.S. Department of Energy Office of Energy Efficiency & Renewable Energy Solar Energy Technologies Program Systems Integration Subprogram DOE/GO-102009-2848 June 2009. http://www1.eere.energy.gov/solar/pdfs/pv_grid_penetration.pdf

¹¹ **Integrating Wind Power in Portugal** by Pedro S. Moura. Renewable Energy World Magazine. Volume 12 Issue 6, November/December 2009. www.renewableenergyworld.com/rea/news/article/2009/12/integrating-wind-power-in-portugal

(VI) Unfair Monopolistic Power

A cogeneration unit produces two types of power – often heat and electricity. Imagine if the buyer of one type of energy produced demanded that the seller not also produce the other type of energy. This seems absurd. For example, in the life cycle analysis of biofuels many entities believe that a given technology will become profitable by maximizing the number of types and uses of byproducts. However, HECO is proposing that the seller be forbidden from selling any energy to anyone else, even during periods when the utility has curtailed (refused to buy) the energy produced by the seller. This may historically have been a common practice but it is morally and ethically wrong and serves no reasonable and legitimate purpose. The Seller is not a regulated company, yet restricting what they can sell beyond what they are required to sell to the utility, is in fact regulating activities outside of the Commission's jurisdiction.

Hawaiian Electric Companies Feed-In Tariff - Purchases from Tier 3 Eligible Renewable Energy Generating Facilities: (Transmittal Letter Dated April 29, 2010) Item B5: "Any Facility selling electric energy to the Company under this Schedule FIT shall sell all the electric energy it produces above any electric energy produced for Seller's own energy consumption, to the Company for the entire term of the Schedule FIT Agreement. A Seller may not sell electric energy to third parties"

Hawaiian Electric Companies Tier 3 Feed-In Tariff Power Purchase Agreement (March 2010 version) "ARTICLE 8 CONTINUITY OF SERVICE 8.1 General. Company may require Seller to temporarily curtail, interrupt or reduce deliveries of electric energy" "ARTICLE 20 SALE OF ENERGY TO THIRD PARTIES: Seller shall not sell energy from Facility to any Third Party."

(VII) Arbitration

Often the utility seeks to minimize the boundaries of an issue, to allow only a narrow examination of the issues. Other parties often seek to include information outside of the utility's chosen arena. Binding arbitration may focus on the utility's arena. The Commission, but not the arbitrator, would have the option of considering information beyond the "four corners of the contract." The Commission has and is appointing Independent Observers in various areas: Feed-In Tariffs, Requests for Proposals, Competitive Bidding, Energy Efficiency, and perhaps Integrated Resource Planning/Clean Energy Scenario Planning. These Independent Observers represent the Commission in various actions. Their actions are subject to Commission review. Similarly, the Commission might consider appointing an Independent Observer for Standard Offer Contracts and Power Purchase Agreements.

The Commission has the Regulatory Authority over the Company including the approval of the Company's Power Purchase Agreement with the Seller. Notwithstanding any other arbitration provision, no arbitration can be demanded by either party over any contract dispute that is a regulated function under the authority of the Commission over regulated electric utilities for example, Sellers contract energy rates, Company Safety and Operations, and any Commission Decision and Orders. Any dispute of what can or cannot be arbitrated in this contract must be determined by the Commission. This provision must be broadly interpreted in favor of the Seller.

(VIII) Conclusion

HECO, MECO and HELCO should immediately implement Tier 3 Feed-In Tariffs.

Certificate of Service for PUC Docket Number 2008-0273

I hereby certify that I have hand delivered the original and 8 copies of this document, Life of the Land's COMMENTS ON PROPOSED TIER 3 TARIFF FILINGS to the PUC, and two copies to the Consumer Advocate; I have mailed one copy to DEAN MATSUURA, REGULATORY AFFAIRS, HAWAIIAN ELECTRIC COMPANY, INC. via U.S. Post Office Delivery Confirmation. I have sent a pdf copy by email to all parties.

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